Robert G. Crosby
Dow Corning STI
P.O. Box 369
Kendalville, Indiana 46755

Re: Registered Construction and Operation Status,
113-12767-00055

Dear Mr. Crosby:

The application from Dow Corning, Inc., received on October 4, 2000, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-5.5, it has been determined that the following silicone manufacturing operation, to be located at 111 South Progress Drive East, Kendallville, Indiana 46755, classified as registered:

(a) Seven (7) sigma blade style mixers, each with a continuous nitrogen purge:

Two (2) base mixers, identified as M-101 and M-102, with a combined maximum process rate of 589 pounds per hour, venting through individual dump station baghouse filter systems and then exhausting at ambient temperatures to Stacks 9 and 10, respectively, and 2 five (5) compound mixers with a combined maximum process rate of 2089 pound per hour, venting through individual bag filters and then exhausting at ambient temperature: M-103 to Stack 5; M-104 to Stack 6; M-105 to Stack 7, M-108 to Stack 4; and M-110 to Stack 8; each with a maximum design flow rate of 5 dscm.

(b) One (1) natural gas-fired boiler with a maximum heat input rate of 3.0 MMBtu/hr.

(c) One (1) natural gas-fired boiler with a maximum heat input rate of 1.5 MMBtu/hr.

(d) One (1) natural gas-fired space heater with a maximum heat input rate of 0.938 MMBtu/hr.

(e) One (1) outdoor silo for storage of fumed silica products with a capacity of 39,000 pounds, including one (1) diaphragm pump with a dilute phase transfer loading rate of 7,200 lb/hr, with PM emissions controlled by baghouse 11 and exhausted to a bin vent stack identified as Stack 11.

(f) One (1) PRISM silicone rubber manufacturing operation, identified as PRISM, with emissions controlled by a vent condenser, identified as HX-103, and a baghouse, identified as DC-103, with emissions exhausting to stack DC-103.

(g) One (1) 3.4 MMBtu/hr natural gas fired steam boiler, identified as UT-126, with emission exhausted through Stack UT-126.

(h) One (1) 5 micron silica storage silo (MH-140) with capacity of 100,000 lbs including one (1) pneumatic transporter with a maximum rate of 3,000 lbs/hr with PM emissions controlled with a bin vent.

(I) One (1) 10 micron silica storage silo (MH-142) with a capacity of 100,000 lbs including one (1) pneumatic transporter with a maximum rate of 3,000 lbs/hr, with PM emission controlled with a bin vent.

(j) Five (5) weight hoppers equipped with bin vents that vent to the atmosphere.

The following conditions shall be applicable:

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minute (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor in a six (6) hour period.

326 IAC 5-1 (Visible Emissions Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of forty percent (40%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

326 IAC 6-2-4 (Emission Limitations for Facilities specified in 326 IAC 6-2-1(d))

(a) Particulate emissions from indirect heating facilities shall not exceed 0.6 pounds per MMBtu.

326 IAC 6-3-2 (Process Operations)

Pursuant to CP-10553-00055, issued on March 8, 1999, the particulate matter (PM) from the silicone manufacturing shall be limited by the following:

Interpolation and extrapolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 4.10\ P^{0.67}$ where E = rate of emission in pounds per hour and
P = process weight rate in tons per hour

The bin vents shall be in operation at all times the silicone manufacturing facility is in operation, in order to comply with this limit.

Allowable PM Emission Based on 326 IAC 6-3-2

| Process | Allowable PM Emission (Pounds Per Hour) |
|---|---|
| Silos | |
| Previous Permitted Equipment* | 9.67 |
| New Equipment | 12.05 |
| Weigh Hoppers | |
| New Equipment | 1.88 |
| Compound Mixers | |
| Previous Equipment* | 4.22 |
| New Equipment | 3.18 |
| Base Mixers* | 1.81 |
| PRISM* | 6.08 |

Allowable emissions are determined from the applicability of rule 326 IAC 6-2.
* From TSD Permit 113-10553-00055.

The potential emissions are less than the allowable emissions, therefore, potential emissions are used for the permitting determination.

This is a revised registration issued to this source. The source may operate according to 326 IAC 2-5.5.

An authorized individual shall provide an annual notice to the Office of Air Management that the source is in operation and in compliance with this registration pursuant to 326 IAC 2-5.5-4(a)(3). The annual notice shall be submitted to:

**Compliance Data Section**
**Office of Air Management**
**100 North Senate Avenue**
**P.O. Box 6015**
**Indianapolis, IN 46206-6015**

no later than March 1 of each year, with the annual notice being submitted in the format attached.

An application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Management (OAM) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

Sincerely,

Paul Dubenetzky, Chief
Permits Branch
Office of Air Management

ERG/RB

cc: File - Noble County
Noble County Health Department
Northern Regional Office
Air Compliance - Doyle Houser
Permit Tracking - Janet Mobley
Technical Support and Modeling - Michele Boner
Compliance Data Section - Karen Nowak

# Registration

This form should be used to comply with the notification requirements under 326 IAC 2-5.5-4(a)(3).

| | |
|---|---|
| **Company Name:** | **Dow Corning, STI** |
| **Address:** | **111 S. Progress Drive East** |
| **City:** | **Kendallville, Indiana** |
| **Authorized individual:** | **Robert G. Crosby** |
| **Phone #:** | **(219) 347-5819** |
| **Registration #:** | **113-12767-00055** |

I hereby certify that Dow Corning, STI is still in operation and is in compliance with the requirements of Registration 013-12767-00055.

| |
|---|
| **Name (typed):** |
| **Title:** |
| **Signature:** |
| **Date:** |

# Indiana Department of Environmental Management (IDEM)
# Office of Air Management

## Technical Support Document (TSD) for a Registration

**Source Background and Description**

| | |
|---|---|
| Source Name: | Dow Corning, STI |
| Source Location: | 111 South Progress Drive East, Kendallville, IN 46755 |
| County: | Noble |
| Construction Permit No.: | 113-12767-00055 |
| SIC Code: | 2822 |
| Permit Reviewer: | ERG/RB |

The Office of Air Management (OAM) has reviewed an application from Dow Corning STI, relating to the construction and operation of a silicone rubber manufacturing facility.

**Permitted Emission Units and Pollution Control Equipment**

The source consists of the following emission units and pollution control devices:

(a) Seven (7) sigma blade style mixers, each with a continuous nitrogen purge:

Two (2) base mixers, identified as M-101 and M-102, with a combined maximum process rate of 589 pounds per hour, venting through individual dump station baghouse filter systems and then exhausting at ambient temperatures to Stacks 9 and 10, respectively, and five (5) compound mixers with a combined maximum process rate of 2089 pound per hour, venting through individual bag filters and then exhausting at ambient temperature: M-103 to Stack 5; M-104 to Stack 6; M-105 to Stack 7, M-108 to Stack 4; and M-110 to Stack 8; each with a maximum design flow rate of 5 dscm.

(b) One (1) natural gas-fired boiler with a maximum heat input rate of 3.0 MMBtu/hr.

(c) One (1) natural gas-fired boiler with a maximum heat input rate of 1.5 MMBtu/hr.

(d) One (1) natural gas-fired space heater with a maximum heat input rate of 0.938 MMBtu/hr.

(e) One (1) outdoor silo for storage of fumed silica products with a capacity of 39,000 pounds, including one (1) diaphragm pump with a dilute phase transfer loading rate of 7,200 lb/hr, with PM emissions controlled by baghouse 11 and exhausted to a bin vent stack identified as Stack 11.

(f) One (1) PRISM silicone rubber manufacturing operation, identified as PRISM, with emissions controlled by a vent condenser, identified as HX-103, and a baghouse, identified as DC-103, with emissions exhausting to stack DC-103.

(g) One (1) 3.4 MMBtu/hr natural gas fired steam boiler, identified as UT-126, with emission exhausted through Stack UT-126.

**New Emission Units and Pollution Control Equipment**

(a) One (1) 5 micron silica storage silo (MH-140) with capacity of 100,000 lbs including one (1) pneumatic transporter with a maximum rate of 3,000 lbs/hr with PM emissions controlled with a bin vent.

(b) One (1) 10 micron silica storage silo (MH-142) with a capacity of 100,000 lbs including one (1) pneumatic transporter with a maximum rate of 3,000 lbs/hr, with PM emission controlled with a bin vent.

(c) Two (2) compounding mixers (M-106 and M-107) equipped with weigh hoppers. Both the mixers and the weight hoppers are equipped with bin vents that emit into the atmosphere through Stack M-106, M-107, MH-106 and MH-107.

**Existing Approvals**

The source has been operating under previous approvals including, but not limited to, the following:

(a) CP 113-5755-00055 issued on October 9, 1996.

(b) CP 113-9700-00055 issued on May 20, 1998.

(c) CP 113-10553-00055 issued on March 8, 1999.

| Stack ID | Operation | Height (feet) | Diameter (feet) | Flow Rate (acfm) | Temperature ($^0$F) |
|---|---|---|---|---|---|
| MH-140 | Storage silo bin vent | 40 | 0.5 | 0-900 | Ambient |
| MH-142 | Storage silo bin vent | 40 | 0.5 | 0-900 | Ambient |
| MH-103 | Receiver/weigh hopper bin vent | 30 | 0.3 | 0-150 | Ambient |
| MH-104 | Receiver/weigh hopper bin vent | 30 | 0.3 | 0-150 | Ambient |
| MH-105 | Receiver/weigh hopper bin vent | 30 | 0.3 | 0-150 | Ambient |
| MH-106 | Receiver/weigh hopper bin vent | 30 | 0.3 | 0-150 | Ambient |
| MH-107 | Receiver/weigh hopper bin vent | 30 | 0.3 | 0-150 | Ambient |

| Stack ID | Operation | Height (feet) | Diameter (feet) | Flow Rate (acfm) | Temperature ($^0$F) |
|---|---|---|---|---|---|
| 9 | Base mixer | 29 | --- | 10 | Ambient |
| 10 | Bin vent | 29 | --- | 10 | Ambient |
| M-103 | Compound mixer bin vent | 30 | 0.3 | 0-15 | Ambient |
| M-104 | Compound mixer bin vent | 30 | 0.3 | 0-15 | Ambient |
| M-105 | Compound mixer bin vent | 30 | 0.3 | 0-15 | Ambient |
| M-106 | Compound mixer bin vent | 30 | 0.3 | 0-15 | Ambient |
| M-107 | Compound mixer bin vent | 30 | 0.3 | 0-15 | Ambient |

**Enforcement Issue**

There are no enforcement actions pending.

**Recommendation**

The staff recommends to the Commissioner that the operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on October 4, 2000, with additional information received on November 6, 2000.

**Emissions Calculations**

See Appendix A of this document for detailed emission calculations (Appendix pages 1 through 6).

**Potential to Emit**

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, the department, or the appropriate local air pollution control agency.”

| Pollutant | Potential To Emit (tons/year) |
|---|---|
| PM | 10.61 |
| PM-10 | 10.57 |
| $SO_2$ | --- |
| VOC | 0.1 |
| CO | 2.0 |
| $NO_x$ | 2.4 |

(a) The potential to emit (as defined in 326 IAC 2-7-1(29)) of all criteria pollutants are less than 25 tons per year. Therefore, the source is not subject to the provisions of 326 IAC 2-7.

(b) The potential to emit (as defined in 326 IAC 2-7-1(29)) of any single HAP is less than ten (10) tons per year and the potential to emit (as defined in 326 IAC 2-7-1(29)) of a combination HAPs is less than twenty-five (25) tons per year. Therefore, the source is not subject to the provisions of 326 IAC 2-7.

(c) The potential to emit as defined in 326 IAC 2-7-1(29) of any criteria pollutant is less than 25 tons per year but greater than 5 tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-5.5 for silicone.

**Allowable PM Emission**

| Process | Allowable PM Emission (Pounds Per Hour) | Potential PM Emissions (Pounds Per Hour) |
|---|---|---|
| Boiler[a] 1.5 MMBtu | 0.90 | 0.00 |
| Boiler[a] 3.0 MMBtu | 1.80 | 0.00 |
| Boiler[a] 3.4 MMBtu | 2.04 | 0.00 |
| Silos[b] | | |
| Previous Equipment[c] | 9.67 | 0.04 |
| New Equipment | 12.05 | 0.31 |
| Weigh Hoppers[b] | | |
| New Equipment | 1.88 | 0.05 |
| Compound Mixers[b] | | |
| Previous Equipment[c] | 4.22 | 0.24 |
| New Equipment | 3.18 | 0.40 |
| Base Mixers[b, c] | 1.81 | 1.19 |
| PRISM[b, c] | 6.08 | 0.02 |

[a] Allowable emissions are determined from the applicability rule 326 IAC 6-3.
[b] Allowable emissions are determined from the applicability of rule 326 IAC 6-2.
[c] From TSD Permit 113-10553-00055.

The potential emissions are less than the allowable emissions, therefore, potential emissions are used for the permitting determination.

**Actual Emissions**

No previous emission data has been received from the source.

**County Attainment Status**

The source is located in Noble County.

| Pollutant | Status |
|---|---|
| PM-10 | Attainment |
| $SO_2$ | Attainment |
| $NO_2$ | Attainment |
| Ozone | Attainment |
| CO | Attainment |
| Lead | Attainment |

**Federal Rule Applicability**

(a) This source is not subject to the requirements of the New Source Performance Standard, 326 IAC 12, (40 CFR 60.40), Subpart Dc, because the boiler capacity is less than 10 MMBtu/hr.

(b) There are no national emission standards for hazardous air pollutants (NESHAP) (326 IAC 14 and 40 CFR 63 applicable to this source.

**State Rule Applicability - Entire Source**

326 IAC 2-6 (Emission Reporting)

This source is located in Noble County and the potential to emit VOC and $NO_X$ is less than ten (10) tons per year and its potential to emit PM10 is less than one-hundred (100) tons per year including fugitive emissions, therefore, 326 IAC 2-6 does not apply.

326 IAC 5-1 (Visible Emissions Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of forty percent (40%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

326 IAC 6-3-2 (Process Operations)

Pursuant to CP 113-10553-00055, issued on March 8, 1999, the particulate matter (PM) from the silicone manufacturing operation shall be determined using the following equation:

Interpolation and extrapolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 4.10P^{0.67}$ where E = rate of emission in pounds per hour and
P = process weight rate in tons per hour

The bin vents shall be in place at all times the silicone manufacturing facility is in operation to comply with this limit.

Allowable PM Emission based on 326 IAC 6-3-2

| Process | Allowable PM Emission (Pounds Per Hour) | Potential PM Emissions (Pounds Per Hour) |
|---|---|---|
| Silos | | |
| Previous Equipment* | 9.67 | 0.04 |
| New Equipment | 12.05 | 0.31 |
| Weigh Hoppers | | |
| New Equipment | 1.88 | 0.05 |
| Compound Mixers | | |
| Previous Equipment* | 4.22 | 0.24 |
| New Equipment | 3.18 | 0.40 |
| Base Mixers* | 1.81 | 1.19 |
| PRISM* | 6.08 | 0.02 |

Allowable emissions are determined from the applicability of rule 326 IAC 6-2.
* From TSD Permit 113-10553-00055.

The potential emissions are less than the allowable emissions, therefore, potential emissions are used for the permitting determination.

326 IAC 6-2-4 (Emission Limitations for Facilities specified in 326 IAC 6-2-1(d))

(a) Particulate emissions from indirect heating facilities constructed after September 21, 1983 shall be limited by the following equation:

$$Pt = \frac{1.09}{Q^{0.26}}$$

Where: Pt = Pounds of particulate matter emitted per million Btu (lb/MMBtu) heat input.
Q = Total source maximum operating capacity rating in million Btu per hour (MMBTU/hr) heat input. The maximum operating capacity rating is defined as maximum capacity at which the facility is operated or the nameplate capacity, whichever is specified in the facility's permit application, except when some lower capacity is conducted in the facility's operation permit; in which case, the capacity specified in the operation permit shall be used. For the equipment used at Dow Corning, the Pt would be calculated to be 0.64 pound per hour.

For Q less than 10 MMBtu/hr, Pt shall not exceed 0.6 pounds per hour therefore the limit for boilers will be set at 0.6 pounds per hour.

(b) As each new indirect heating facility is added to a plant Q will increase. As a result, the emission limitations for each progressively newer facility will be more stringent until the total plant capacity reaches 10,000 MMBtu/hr after which the emission limit for each newer facility will be 0.1 lb/MMBtu heat input. The rated capacities for facilities regulated by 326 IAC 12, New Source Performance Standards, shall be included when calculating Q for subsequent facilities.

**Conclusion**

The construction and operation of this silicone manufacturing facility shall be subject to the conditions of the attached proposed Registration No. 113-12767-00055.

**Appendix A**

**Emission Calculations**

The following calculations list the source unrestricted potential to emit (PTE) for all units from this source.

1. Existing Permitted Sigma Blade Style Mixers and Boiler Emissions:

The following are the PTE calculations for the mixers and combustion unit permitted in Registration CP 113-5755-00055, issued on October 9, 1996:

Plant Atmosphere:

313 pounds of PM were collected in 116 days by the two plant atmosphere filter units. Each of these Sly Pactecon bag filtering units has a collection efficiency of 99.9%. Both units operate 24 hours per day, 365 days per year.

The normal production rate of silicone is 2333 lb/hr with a 5 day week, 24 hours per day. The maximum production rate for a 7 day week is 2678 lb/hr.

**(313 lb PM collected)/116 days = 2.698 lb/day collected**

**PM Before Control:** = lb/day collected * (1 + (1 - collection efficiency)
= 2.698 lb/day * (1 + (1 - 0.995))
= 2.711 lb/day

**Maximum Capacity Factor:** = max. prod. rate/avg. production rate
= (2678 lb/7 day week)/(2333 lb/5 day week) = 1.6

**Maximum Plant Atmosphere Particulate:**

= particulate before controls * max. capacity factor
= 2.711 lb/day * 1.6 = 4.338 lb/day

4.338 lb/day * 365 day/yr * 1/2000 ton/lb = 0.792 ton/yr

Approximately 95% of the powdered additives used in the silicone rubber processing are 10 micron size or smaller. Therefore, an estimated 95% of the particulate emissions before control will be PM10.

| | | | | |
|---|---|---|---|---|
| 4.338 lb/day | * | 0.95 | = | 4.12 lb PM 10/day |
| 0.792 ton/yr | * | 0.95 | = | 0.75 ton PM 10/yr |

**Silicon Compound Mixers:**

Each of the filters on the compound mixers has an estimated efficiency of 99.5%. Each mixer operates 24 hours per day, normal operation is 5 days per week. The maximum total rate of powder use for the 5 compound mixers is 564 lb/hr. All of the powder used in the compound mixers is 5 to 10 microns in size. Therefore, all particulate emissions are PM10.

**Low Boy Design (Mixers #102 and 104):**

In a test Mixer #104, powder added to mix = 2545.49, particulate collected = 0.38 lb

(0.38 lb PM collected/2545.49 lb powder used) = 1.493 E-4 lb PM collected/lb powder used

**PM Before Controls:** = 1.493 E-4 lb PM/lb powder used * (1 + (1 - collection efficiency))
= 1.493 E-4 lb PM/lb powder used * (1 - 1 - 0.995))
= 1.50 E-4 lb PM/lb powder used

Max PM from 2 low boy mixers = 2/5 * 564 lb powder/hr * 1.50 E-4 lb PM/lb powder = 0.034 lb/hr

**Standard Design (Mixers #101, 103, and105):**

In a test with mixer #105: powder used added to mix = 3652 lb and particulate collected = 2.08 lb.

(2.08 lb PM collected /3652 lb powder used) = 5.839 E-4 lb PM collected per lb powder used

**PM Before Controls:** = 5.839 E-4 lb PM/lb powder used * (1 + (1 - collection efficiency))
= 5.839 E-4 lb PM/lb powder used * (1 + (1 - 0.995))
= 5.87 E-4 lb PM/lb powder used

Max PM from 3 Standard Mixers = 3/5 * 564 lb powder/hr * 5.87 E-4 lb PM/lb powder = 0.2 lb/hr

Total PM/PM10 from the 5 compound mixers = 0.234 lb/hr * 8760 hr/yr * 1/2000 ton/lb = 1.025 ton/yr

**Silicon Base Mixers:**

Each of the base mixers is used with a filter bag dump station. All of the particulate controlled by the filters is automatically fed into the mixers. There is no data available on the amount of particulate entering the filters exiting them. No outlet grain loading could be obtained from Dow Corning STI or from their baghouse and bag supplier, Young Industries.

Each mixer operates 24 hours per day. The total rate of powder use for the 2 base mixers is 153 lb/hr. All of the powder used in the base manufacturing operation is 10 microns or smaller. Therefore, approximately 78% of the particulate emissions before controls will be PM10.

No published emission factors could be found for this type of silicon rubber production. The powders added to the mixer are very small particle size, 0./4 micron and 15 micron average. Other processes which handle fine powder have published emission factors of 0.1% to 1%. To be most conservative, 1% was used with the concurrence of the company contact.

**Potential PM Before Controls:** = 153 lb powder * 0.01 lb PM/lb powder = 1.53 lb PM/hr
= 1.53 lb/hr * 8760 hr/yr * 1/2000 ton/lb * 0.78 = 5.23 ton PM 10/yr

**2. Silo Emissions:**

The following are the silo PTE emission calculations as determined in Exemption 113-9700-00055, issued on May 20, 1998:

Fumed silica is stored in an outdoor silo. The particulate matter emissions from the loading and unloading operation of the silo will be controlled by a baghouse. The silo is loaded and unloaded pneumatically. Therefore, the baghouse is considered as an integral part of the system. Therefore, the PM (PM10) PTE are the PM (PM10) emissions after controls.

**0.07 gr/dscf * 60 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 1/2000 ton/lb = 0.16 ton PM (PM10)/yr**

Permit 113-12767-00055 included two additional silos.

**0.02 gr/dscf * 60 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 1 ton/2000 lb = 0.67 tons/year**

**0.675 tons PM(PM10)/year * 2 = 1.35**

**3. Proposed PRISM Manufacturing Operation and Steam Generating Boiler Emissions:**

The following calculations determine the PTE of the PRISM manufacturing operation and steam generating boiler.

**PRISM Manufacturing Operation:**

The prism manufacturing operation generates PM (PM10) emissions. In addition, the PRISM manufacturing operation includes a pneumatic conveyor for the materials used. Thus, the conveyor is determined to be integral to the operation and the PM (PM10) emissions used for permitting purposes shall be the PM (PM10) emissions after controls.

Dow Corning has submitted a grain loading of 0.000185 which is determined to be unacceptable. Thus the grain loading has been truncated to 0.001 gr/dscf.

**0.001 gr/dscf * 2080 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 1/2000 ton/lb = 0.08 ton PM (PM10)yr**

**4. Additional Weigh Hopper Emissions**

Permit 113-12767-00055 included emissions estimate for the additional weigh hoppers.

**0.02 gr/dscf * 150 acfm * 60 m/hr * 8760 hr/year * 1 lb/7000 gr * 1 ton/2000 lbs = 0.11 tons/yr**

**0.11 tons PM (PM10)/year * 2 = 0.22 tons PM (PM10)/year**

## 5. Additional Mixers

Permit 113-12767-00055 included two additional mixers. The PM estimates for the additional mixers were based on the earlier TSD.

**5.839 E-4 lb PM/lb of powder * 685 lb/hr * 8760 hr/year * 1 ton/2000 lb = 1.75 tons PM (PM10)/year**

**Appendix A: Emissions Calculations**
**Natural Gas Combustion Only**
**MM BTU/HR <100**
**Small Industrial Boiler**

**Company Name:** **Dow Corning STI**
**Address City IN Zip:** **Kendallville, IN 46755**
**CP:** **113-12767**
**Plt ID:** **113-55**
**Reviewer:** ERG/RB
**Date:** 11/16/2000

| Heat Input Capacity MMBtu/hr | Potential Throughput MMCF/yr |
|---|---|
| 7.9 | 69.2 |

| | Pollutant | | | | | |
|---|---|---|---|---|---|---|
| | PM* | PM10* | SO2 | NOx | VOC | CO |
| Emission Factor in lb/MMCF | 1.9 | 7.6 | 0.6 | 100.0 **see below | 5.5 | 84.0 |
| Potential Emission in tons/yr | 0.1 | 0.3 | 0.0 | 3.5 | 0.2 | 2.9 |

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.
**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

**Methodology**

All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu
Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
Note: Check the applicable rules and test methods for PM and PM10 when using the above emission factors to confirm that the correct factor is used (i.e., condensable included/not included).
See page 2 for HAPs emissions calculations.

**Appendix A: Emissions Calculations**
**Natural Gas Combustion Only**
**MM BTU/HR <100**
**Small Industrial Boiler**
**HAPs Emissions**

**Company Name:** **Dow Corning STI**
**Address City IN Zip:** **Kendallville, IN 46755**
**CP:** **113-12767**
**Plt ID:** **113-55**
**Reviewer:** ERG/RB
**Date:** 11/16/2000

HAPs - Organics

| | Benzene | Dichlorobenzene | Formaldehyde | Hexane | Toluene |
|---|---|---|---|---|---|
| Emission Factor in lb/MMcf | 2.1E-03 | 1.2E-03 | 7.5E-02 | 1.8E+00 | 3.4E-03 |
| Potential Emission in tons/yr | 7.266E-05 | 4.152E-05 | 2.595E-03 | 6.228E-02 | 1.176E-04 |

HAPs - Metals

| | Lead | Cadmium | Chromium | Manganese | Nickel |
|---|---|---|---|---|---|
| Emission Factor in lb/MMcf | 5.0E-04 | 1.1E-03 | 1.4E-03 | 3.8E-04 | 2.1E-03 |
| Potential Emission in tons/yr | 1.730E-05 | 3.806E-05 | 4.844E-05 | 1.315E-05 | 7.266E-05 |

Methodology is the same as page 1.

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.